

JP10 108129 part

RCA PD020106 AB+AD

CITED BY APPLICANT

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平10-108129

(43) 公開日 平成10年(1998) 4月24日

(51) IntCl⁴H04N 5/91
5/278

識別記号

F I

H04N 5/91
5/278

E

審査請求 未請求 請求項の数1 FD (全4頁)

(21) 出願番号 特願平8-273974

(22) 出願日 平成8年(1996) 9月26日

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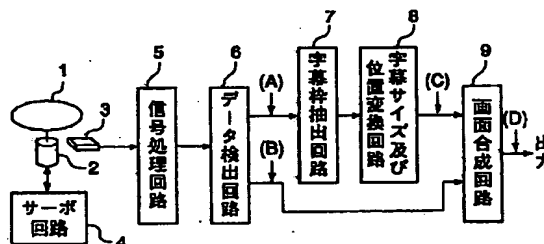
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(54) 【発明の名称】 ビデオディスク再生装置

(57) 【要約】

【課題】 本発明の目的は、字幕付映像信号を独特の形式に記録したビデオディスクを再生するビデオディスク再生装置を提供することにある。

【解決手段】 第1の信号ブロックには字幕のない映像信号のみを記録し、第2の信号ブロックには基準となるサイズ、位置を有する字幕データをグラフィックデータとして記録したビデオディスクからデータを読み出すためのデータ読み出し手段と、読み出されたデータを映像データと字幕データに分けるデータ検出手段と、前記データ検出手段よりの前記字幕データからその字幕データの全てを含む大きさの字幕枠を決定する字幕枠抽出手段と、前記字幕枠抽出手段で抽出された字幕枠内にある字幕データを、指定したサイズ、位置に変換する字幕サイズ及び位置変換手段と、前記字幕サイズ及び位置変換手段からの字幕データと前記データ検出手段からの映像データとを合成する画面合成手段とからなるものである。



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【特許請求の範囲】

【請求項1】 第1の信号ブロックには字幕のない映像信号のみを記録し、第2の信号ブロックには基準となるサイズ、位置を有する字幕データをグラフィックデータとして記録したビデオディスクからデータを読み出すためのデータ読み出し手段と、前記データ読み出し手段で読み出されたデータを映像データと字幕データに分けるデータ検出手段と、前記データ検出手段よりの前記字幕データからその字幕データの全てを含む大きさの字幕枠を決定する字幕枠抽出手段と、前記字幕枠抽出手段で抽出された字幕枠内にある字幕データを、指定したサイズ、位置に変換する字幕サイズ及び位置変換手段と、前記字幕サイズ及び位置変換手段からの字幕データと前記データ検出手段からの映像データとを合成する画面合成手段とからなることを特徴とするビデオディスク再生装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、ビデオディスク再生装置に関する。

【0002】

【従来の技術】 従来、字幕付の映像信号を記録済みのビデオディスクがあるが、このようなビデオディスクを再生する際、背景に重なっている字幕の位置が問題になることがある。そこで、ビデオディスクの再生時に、この字幕の位置やサイズを変えて画面に出すことができるビデオディスク再生装置がある。

【0003】 図5は、このようなビデオディスク再生装置の一例を示すブロック図であり、図6は、図5のビデオディスク再生装置の各構成要素の動作を説明する画像概念図である。図5において、11は映像信号に字幕（この例では「字幕」という文字）が重なった映像データが記録されたビデオディスク、12はビデオディスク11を回転させるモータ、13はビデオディスク11から映像データを読み出すピックアップ、14はサーボ回路、15は再生された映像データを処理する信号処理回路、16は信号処理回路15で処理された映像データ（図6の（A））から字幕データ（図6の（B））と映像信号（図6の（C））を分離する字幕分離回路、17は字幕分離回路16より出力された字幕データのサイズ及び位置を変換（図6の（D））する字幕サイズ及び位置変換回路、18は、字幕分離回路16からの映像データと字幕サイズ及び位置変換回路17からの字幕データとを合成（図6の（E））する画面合成回路である。

【0004】

【発明が解決しようとする課題】 しかしながら、上記構成のビデオディスク再生装置では、ビデオディスク11には本来の映像信号にすでに字幕が重なっている映像データしか記録されていないため、字幕の背景が黒のみ（映像信号がない）の場合であれば字幕の抽出は容易で

あるが、字幕の背景が黒でない（映像信号がある）場合は、背景の映像信号によっては字幕のみを正確に抽出することができないので、サイズや位置の変更ができる字幕は限られていた。

【0005】 本発明の目的は、字幕付映像信号を記録したビデオディスクを再生して字幕のサイズ、位置の変更が簡単かつ正確に行えるビデオディスク再生装置を提供することにある。

【0006】

【課題を解決するための手段】 本発明に係るビデオディスク再生装置は、第1の信号ブロックには字幕のない映像信号のみを記録し、第2の信号ブロックには基準となるサイズ、位置を有する字幕データをグラフィックデータとして記録したビデオディスクからデータを読み出すためのデータ読み出し手段と、前記データ読み出し手段で読み出されたデータを映像データと字幕データに分けるデータ検出手段と、前記データ検出手段よりの前記字幕データからその字幕データの全てを含む大きさの字幕枠を決定する字幕枠抽出手段と、前記字幕枠抽出手段で抽出された字幕枠内にある字幕データを、指定したサイズ、位置に変換する字幕サイズ及び位置変換手段と、前記字幕サイズ及び位置変換手段からの字幕データと前記データ検出手段からの映像データとを合成する画面合成手段とからなるものである。

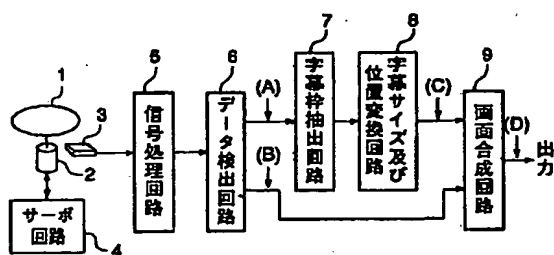
【0007】

【作用】 字幕付映像信号を映像データのみと字幕データのみに分け、ビデオディスクの第1の信号ブロックには字幕のない映像信号のみを記録し、第2の信号ブロックには基準となるサイズ、位置を有する字幕データをグラフィックデータとして記録する。ビデオディスク再生装置は、上記のように記録されたビデオディスクを再生し、データ検出手段で映像データと字幕データを分離し、字幕枠抽出手段でこの基準となる字幕データを全て含む字幕枠を決定し、字幕サイズ及び位置変換手段で字幕枠抽出手段により抽出された字幕枠内にある字幕データを、指定したサイズ、位置に変換し、画面合成手段で字幕サイズ及び位置変換手段からの字幕データとデータ検出手段からの映像データとを合成する。したがって、字幕データが本来の映像信号とは独立して再生、加工されるので、字幕データの抽出は本来の映像信号に関係なく正確かつ簡単にできる。

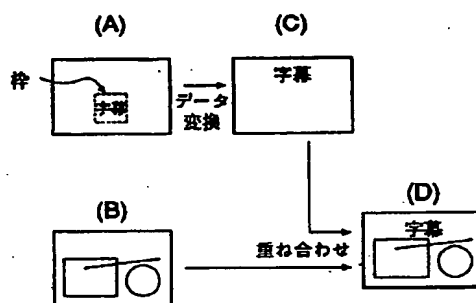
【0008】

【発明の実施の形態】 以下、本発明の実施例を図1乃至図3により説明する。図1は、本発明に係るビデオディスク再生装置の一例を示すブロック図であり、図2は、図1のビデオディスク再生装置の各構成要素の動作を説明する画像概念図であり、図3は図1のブロック図の動作を説明するフローチャートである。図1において、1はビデオディスク、2はビデオディスク1を回転させるモータ、3はビデオディスク1からデータを読み出すビ

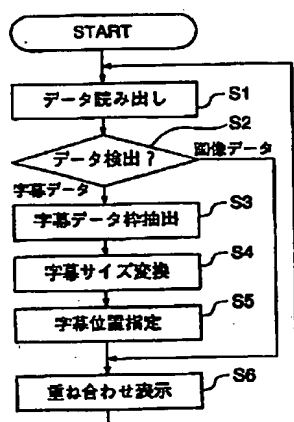
【図1】



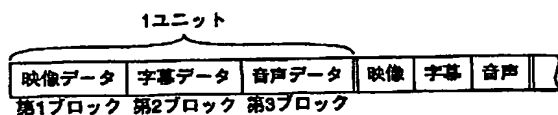
【図2】



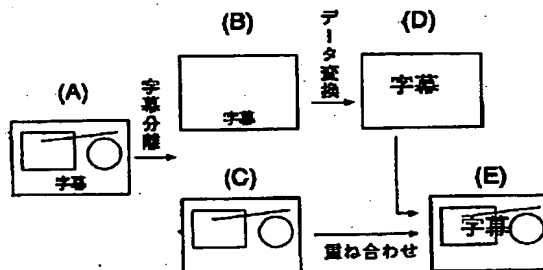
【図3】



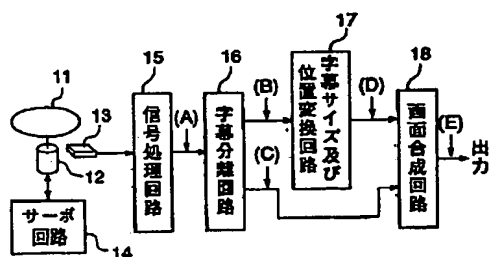
【図4】



【図6】



【図5】



EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

RCA *PDO20106 AB + AD*

PUBLICATION NUMBER : 10108129
PUBLICATION DATE : 24-04-98

H42-469419

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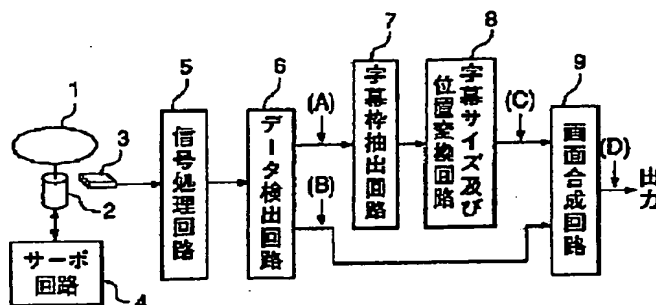
APPLICATION DATE : 26-09-96
APPLICATION NUMBER : 08273974

APPLICANT : KENWOOD CORP;

INVENTOR : YONEZAWA NAOKI;

INT.CL. : H04N 5/91 H04N 5/278

TITLE : VIDEO DISK REPRODUCTION DEVICE



ABSTRACT : **PROBLEM TO BE SOLVED:** To simply and precisely change the size of a caption and its position by dividing data from a video disk into video data and caption data and reproducing and processing the caption data independently of the video data.

SOLUTION: Data are read from a video disk 1 and a data detection circuit 6 divides the data into video data and caption data. Since the caption data as to a reference size and position are written in the data of a block from the data detection circuit 6, an image synthesis circuit 9 superimposes the data onto video data and the resulting data are displayed unless otherwise designated. In the case of desiring to change the caption size and position, a caption frame extract circuit 7 extracts the caption data, and a caption size and position conversion circuit 8 converts the caption size and designates the position of the caption data. Then the image synthesis circuit 9 superimposes the video data and the caption data after the conversion and displays the result onto a display device.

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PD020106 US

Japanese Kokai Patent Application No. Hei 10[1998]-108129

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Job No.: 228-103212

Ref.: JP 10-108129/PD020106 US/JTV(GIVE TO DAVIDA)/#6791

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JAPANESE PATENT OFFICE
PATENT JOURNAL (A)
KOKAI PATENT APPLICATION NO. HEI 10[1998]-108129

Int. Cl. ⁵ :	H 04 N 5/91 5/278
Filing No.:	Hei 8[1996]-273974
Filing Date:	September 26, 1996
Publication Date:	April 24, 1998
No. of Claims:	1 (Total of 4 pages; FD)
Examination Request:	Not filed

VIDEO DISK REPRODUCTION DEVICE

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[There are no amendments to this patent.]

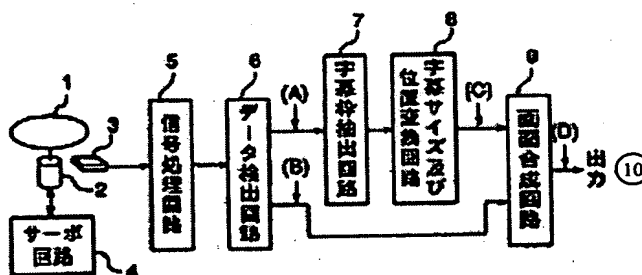
Abstract

Objective

The objective of the present invention is to provide a video disk reproduction device that performs reproduction of a video disk with a captioned video signal recorded in a unique format.

Constitution

A video disk reproduction device characterized by the fact that it is composed of the following parts: a data reading means that reads data from a video disk, which has only the video signal without captions recorded in a first signal block, and which has the caption data with size and position references recorded as graphic data in a second signal block; a data detection means that divides the read data into video data and caption data; a caption frame extraction means that determines the caption frame with a size that included all of the caption data from said caption data from said data detection means; a caption size and position changing means that changes the caption data in the caption frame extracted by said caption frame extraction means to the assigned size and position, and an image synthesis means that synthesizes the caption data from said caption size and position changing means and the video data from said data detection means.



- Key:
- 4 Servo circuit
 - 5 Signal processor
 - 6 Data detector
 - 7 Caption frame extraction circuit
 - 8 Caption size and position changing circuit
 - 9 Image synthesis circuit
 - 10 Output

Claim

A video disk reproduction device characterized by the fact that it is composed of the following parts: a data reading means that reads data from a video disk, which has only the video signal without captions recorded in a first signal block, and which has the caption data with size and position references recorded as graphic data in a second signal block; a data detection means that divides the read data into video data and caption data; a caption frame extraction means that determines the caption frame with a size that includes all of the caption data from said caption data from said data detection means; a caption size and position changing means that changes the caption data in the caption frame extracted by said caption frame extraction means to the

assigned size and position; and an image synthesis means that synthesizes the caption data from said caption size and position changing means and the video data from said data detection means.

Detailed explanation of the invention

[0001]

Technical field of the invention

The present invention pertains to a video disk reproduction device.

[0002]

Prior art

In the prior art, when a video disk having captioned video signal recorded on it is played back, the position of the caption superimposed on the background is a problem. There is a video disk reproduction device that can change the position and size of the caption for display on the screen when the video disk is played back.

[0003]

Figure 5 is a block diagram illustrating an example of the video disk reproduction device of this type. Figure 6 is a schematic diagram illustrating the operation of the various structural elements of the video disk reproduction device shown in Figure 5. In Figure 5, (11) represents the video disk with captioned video data (in this example, the word "caption") superimposed on the received video signal; (12) represents a motor for rotationally driving said video disk (11); (13) represents a pickup for reading the video data from said video disk (11); (14) represents a servo circuit; (15) represents a signal processor that processes the reproduced video data; (16) represents a caption separation circuit that separates the caption data ((B) in Figure 6) and the video signal ((C) in Figure 6) from the video data ((A) in Figure 6) processed by signal processor (15); (17) represents a caption size and position changing circuit that changes the size and position of the caption data output from caption separation circuit (16) ((D) in Figure 6); and (18) represents an image synthesis circuit ((E) in Figure 6) that synthesizes the caption data from caption size and position changing circuit (17) output from caption separation circuit (16).

[0004]

Problems to be solved by the invention

However, for the video disk reproduction device with the aforementioned constitution, only the video data with the caption superimposed on the intrinsic video signal is recorded on video disk (11). Consequently, if the background of the caption is black (when there is no video signal), the caption can be easily extracted. On the other hand, if the background of the caption is

not black (when there is a video signal), it is impossible to extract only the caption correctly from the background video signal. As a result, this scheme is limited only to captions whose size and position cannot be changed.

[0005]

The objective of the present invention is to provide a video disk reproduction device that reproduces a video disk with captioned video signal recorded in a unique format.

[0006]

Means to solve the problems

The video disk reproduction device of the present invention is composed of the following parts: a data reading means that reads data from a video disk, which has only the video signal without captions recorded in a first signal block, and which has the caption data with size and position references recorded as graphic data in a second signal block; a data detection means that divides the read data into video data and caption data; a caption frame extraction means that determines the caption frame with a size that includes all of the caption data from said caption data from said data detection means; a caption size and position changing means that changes the caption data in the caption frame extracted by said caption frame extraction means to the assigned size and position, and an image synthesis means that synthesizes the caption data from said caption size and position changing means and the video data from said data detection means.

[0007]

Operation

The captioned video signal is divided into video data and caption data. The video signal without captions is recorded in a first signal block of the video disk, and the caption data having size and position references are recorded as graphic data in a second signal block. In the video disk reproduction device, said recorded video disk is reproduced, and the signal is separated into video data and caption data by the data detection means. With the caption frame extraction means, a caption frame which contains all of the caption data as a reference is determined. With the caption size and position changing means, the caption data in the caption frame extracted by said caption frame extraction means are converted into the assigned size and position. With the image synthesis means, the caption data from the caption size and position changing means and the video data from the data detection means are synthesized. Consequently, the caption data are reproduced and processed independently of the intrinsic video signal, so that extraction of the caption data can be performed correctly regardless of the intrinsic video signal.

[0008]

Embodiment of the invention

In the following, an explanation will be given regarding application examples with reference to Figures 1-3. Figure 1 is a block diagram illustrating an example of the video disk reproduction device. Figure 2 is a schematic diagram illustrating the operation of the various structural elements of the video disk reproduction device shown in Figure 1. Figure 3 is a flowchart illustrating the operation shown in the block diagram of Figure 1. In Figure 1, (1) represents the video disk; (2) represents a motor for driving said video disk (1) to rotate; (3) represents a pickup for reading the video data from said video disk (1); (4) represents a servo circuit; (5) represents a signal processor that processes the reproduced video data; (6) represents a data detector that separates the video data and caption data from the data processed by signal processor (5); (7) represents a caption frame extraction circuit that determines the caption frame including all of the caption data from the caption data output from data detector (6); (8) represents a size and position changing circuit that changes the size and position assigned to the caption data in the caption data output from caption frame extraction circuit (7), and (9) represents an image synthesis circuit that synthesizes the video data from data detector (6) and the caption data from caption size and position changing circuit (8).

[0009]

For example, said video disk (1) for reproduction by the video disk reproduction device with said constitution may be a digital video disk (DVD) having the data constitution shown in Figure 4. On this video disk, data are recorded as continuous units of independent blocks of video data, caption data, and audio data.

[0010]

Said recorded DVD is reproduced as video disk (1) with the data read out and divided by data detector (6) into video data (such as (B) in Figure 2) and caption (the word "caption" in this example) data (such as (A) in Figure 2)). Because the caption data with the size and position as references are written in the data of the caption data block from data detector (6), when not specified, the data are superimposed on the video data from data detector (6) as is by image synthesis circuit (9), so that the captioned video signal can be displayed.

[0011]

If the user wishes to change the size or position of the caption, the position of the caption data as the reference with caption extraction circuit (7) is evaluated, and a frame that contains all of the evaluated caption data are determined. The size of the extracted caption frame containing

all of the caption data with size and position references in the frame is automatically changed corresponding to the number in characters of the caption, etc. Then, with caption size and position changing circuit (8), the graphic data for the caption in the frame are extracted, and the data are expanded or contracted to the assigned size, and they are moved to the assigned position to get the final caption data (such as (C) in Figure 2). Then, by means of image synthesis circuit (9), the final caption data and the intrinsic video data from data detector (6) are superimposed to product the final signal, and the video signal with changed size and position of the caption (such as (D) in Figure 2) is output and displayed on the display unit (not shown in the figure).

[0012]

In the following, an explanation will be given regarding said operation with reference to the flowchart in Figure 3. In step S1, data are read from video disk (1); in step (S2), the data are detected and separated by data detector (6) into the video data and caption data. If the detected data are image (video) data, the process goes to step S6. If the detected data are the caption data, the process goes to step S3. In step S3, by means of caption frame extraction circuit (7), the caption data frame is extracted. In step S4, the caption size is converted by caption size and position changing circuit (8). In step S5, the caption position is assigned. In step S6, the video data in step S2 and the caption data converted in step S5 are superimposed by means of image synthesis circuit (9) for display on the display unit.

[0013]

In this way, the size and position of the caption can be changed each cycle. When the size and position to be displayed are determined, the value is stored as the initial value in the video disk main body for reading. As a result, if there is no change in the value, it is possible to display the caption with size and position normally determined.

[0014]

Also, because the caption data are written independently of the intrinsic video signal on the video disk, extraction of the caption data can be performed correctly and easily regardless of the intrinsic video signal. Consequently, it is possible to change the size and position of the caption regardless of the background of the caption in the video signal. As a result, the display position of the caption can be easily changed, and the caption size can be changed corresponding to the size of the display image.

[0015]

Effects of the invention

According to the present invention, the size and position of the caption can be changed easily and correctly as a video disk containing a captioned video signal is reproduced by the video disk reproduction device of the present invention.

Brief description of the figures

Figure 1 is a block diagram illustrating an example of the video disk reproduction device pertaining to the present invention.

Figure 2 is a schematic diagram illustrating the operation of the various structural elements of the video disk reproduction device in Figure 1.

Figure 3 is a flow chart illustrating the operation of the block diagram of Figure 1.

Figure 4 is a diagram illustrating an example of the data structure of the digital video disk used as the video disk of the present invention.

Figure 5 is a block diagram illustrating an example of the video disk reproduction device in the prior art.

Figure 6 is a schematic diagram illustrating the operation of the various constituent elements of the video disk reproduction device of Figure 5.

Brief description of the part numbers

- | | |
|---|--|
| 1 | Video disk |
| 2 | Motor |
| 3 | Pickup |
| 4 | Servo circuit |
| 5 | Signal processor |
| 6 | Data detector |
| 7 | Caption frame extraction circuit |
| 8 | Caption size and position changing circuit |
| 9 | Image synthesis circuit |

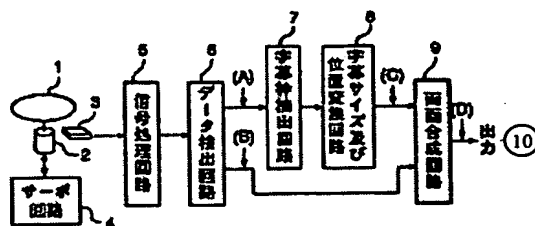


Figure 1

- Key:
- 4 Servo circuit
 - 5 Signal processor
 - 6 Data detector
 - 7 Caption frame extraction circuit
 - 8 Caption size and position changing circuit
 - 9 Image synthesis circuit
 - 10 Output

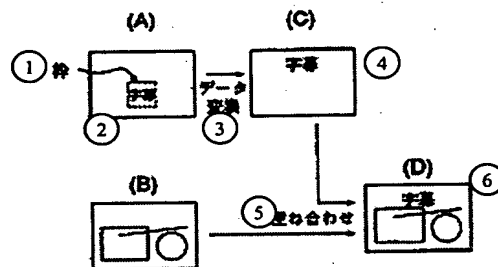


Figure 2

- Key:
- 1 Frame
 - 2 Caption
 - 3 Data conversion
 - 4 Caption
 - 5 Superimposed
 - 6 Caption

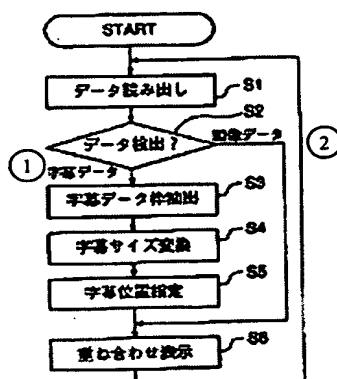


Figure 3

- Key:
- S1 Data read
 - S2 Data detected?
 - S3 Extraction of caption data frame
 - S4 Conversion of caption size
 - S5 Assignment of caption position
 - S6 Superimposed for display
 - 1 Caption data
 - 2 Video data

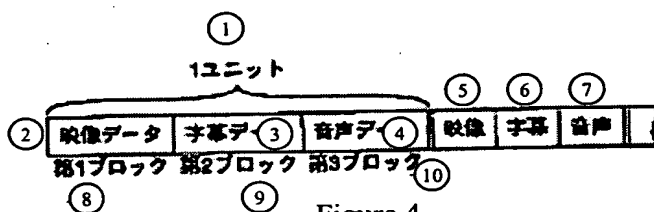


Figure 4

- Key:
- 1 1 unit
 - 2 Video data
 - 3 Caption data
 - 4 Audio data
 - 5 Video
 - 6 Caption
 - 7 Audio
 - 8 First block
 - 9 Second block
 - 10 Third block

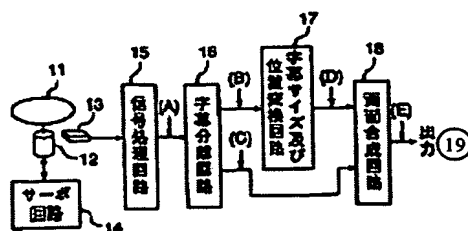


Figure 5

- Key: 14 Servo circuit
 15 Signal processor
 16 Caption separating circuit
 17 Caption size and position changing circuit
 18 Image synthesis circuit
 19 Output

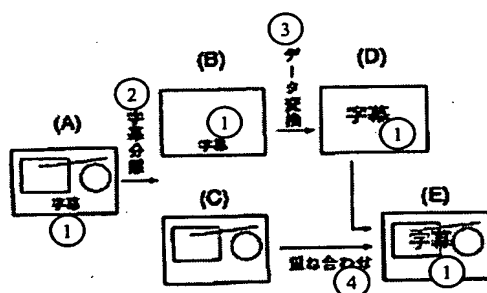


Figure 6

- Key: 1 Caption
 2 Caption separation
 3 Data conversion
 4 Superimposed

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